

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims**

Claims 1 to 15 (*cancelled*)

16. (*currently amended*) A radiopharmaceutical of the formula:

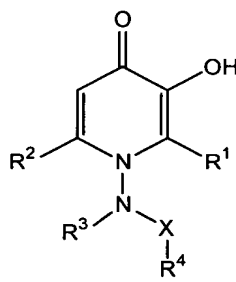


**and or** pharmaceutically acceptable salt thereof, wherein:

M is a radionuclide selected from:  $^{64}\text{Cu}$ ,  $^{67}\text{Cu}$ ,  $^{67}\text{Ga}$ ,  $^{68}\text{Ga}$ ,  $^{99m}\text{Tc}$ ,  $^{111}\text{In}$ ,  $^{90}\text{Y}$ ,  $^{149}\text{Pr}$ ,  $^{153}\text{Sm}$ ,  $^{159}\text{Gd}$ ,  $^{166}\text{Ho}$ ,  $^{169}\text{Yb}$ ,  $^{177}\text{Lu}$ ,  $^{186}\text{Re}$ , and  $^{188}\text{Re}$ ;

**$C_h$  is an N-substituted 3-hydroxy-4-pyridinone compound of the formula**

**(I):**



**or a pharmaceutically acceptable salt thereof, or prodrug thereof, wherein:**

**X is selected from the group:  $\text{CH}_2$ ,  $\text{C}(\text{O})$ ,  $\text{C}(\text{S})$ ,  $\text{P}(\text{O})\text{R}^3\text{R}^4$ ,  $\text{SO}_2$ ,  $\text{C}(=\text{NH})\text{NH}$ ,  $\text{C}(\text{O})\text{NH}$ , and  $\text{C}(\text{S})\text{NH}$ ;**

**$\text{R}^1$  and  $\text{R}^2$  are independently selected from: H,  $\text{C}_1\text{-C}_{10}$  alkyl substituted with 0-5  $\text{R}^5$ ,  $\text{C}_2\text{-C}_{10}$  alkenyl substituted with 0-5  $\text{R}^5$ , aryl substituted with 0-3  $\text{R}^5$ , and heteroaryl substituted with 0-3  $\text{R}^5$ ;**

**$\text{R}^3$  and  $\text{R}^4$  are independently selected from:  $\text{C}_1\text{-C}_{10}$  alkyl substituted with 0-5  $\text{R}^5$ ,  $\text{C}_2\text{-C}_{10}$  alkenyl substituted with 0-5  $\text{R}^5$ , aryl substituted with 0-3  $\text{R}^5$ , and heteroaryl substituted with 0-3  $\text{R}^5$ , or  $\text{R}^3$  and  $\text{R}^4$  may be taken together to form a  $\text{C}_5\text{-C}_7$  cyclic alkyl group optionally interrupted with O or  $\text{NR}^6$ ;**

**R<sup>5</sup> is selected from: OH, C(=O)R<sup>6</sup>, C(=O)OR<sup>6</sup>, C(=O)NR<sup>6</sup>R<sup>7</sup>, PO(OR<sup>6</sup>)(OR<sup>7</sup>), and S(O)<sub>2</sub>OR<sup>6</sup>;**

**R<sup>6</sup> and R<sup>7</sup> are independently selected from: H, C<sub>1</sub>-C<sub>10</sub> alkyl, and aryl; and**

**n is 2 or 3;**

**X is CH<sub>2</sub>;**

**R<sup>1</sup> is H;**

**R<sup>2</sup> is methyl;**

**R<sup>3</sup> and R<sup>4</sup> are taken together form a 6-membered cyclic piperidine ring.**

17. *(currently amended)* The radiopharmaceutical according to claim 16 wherein:

M is a radionuclide selected from: <sup>67</sup>Ga, <sup>68</sup>Ga, <sup>99m</sup>Tc, and <sup>111</sup>In; **and**

n is 3.

18. *(currently amended)* The radiopharmaceutical according to claim 16 wherein:

M is <sup>111</sup>In; **and**

n is 3.

19. *currently amended)* The radiopharmaceutical according to claim 16 wherein:

M is <sup>111</sup>In;

n is 3;

X is CH<sub>2</sub>;

R<sup>1</sup> is H;

R<sup>2</sup> is methyl; **and**

R<sup>3</sup> and R<sup>4</sup> are taken together form a 6-membered cyclic piperidine ring.

20. *(currently amended)* The radiopharmaceutical according to claim 16 wherein:

M is <sup>111</sup>In;

n is 3;

X is CH<sub>2</sub>;

R<sup>1</sup> is H;

R<sup>2</sup> is methyl; **and**

$R^3$  and  $R^4$  are taken together form a 6-membered cyclic **morphine** morpholine ring.

Claims 21 to 24 (*cancelled*)

25. (*currently amended*) A method of preparing a radiopharmaceutical of claim 16, comprising the step of:  
reacting a salt of said radionuclide with an excess of said N-substituted 3-  
hydroxy-4-pyridinone compound of the formula (I).

Claims 26 to 28 (*cancelled*)